DOCUMENT RESUME

ED 280 246 EC 192 150

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TITLE Developing Prescriptions with a Microcomputer Program for Learning Disabled and Gifted Students Based on Learning Style Instructional Strategies.
INSTITUTION Texas Tech Univ., Lubbock. Coll. of Education.
PUB DATE [83]
NOTE 16p.
PUB TYPE Reports - Research/Technical (143)

EDRS PRICE MF01/PC01 Plus Postage.
DESCRIPTORS Administrative Organization; *Cognitive Style; Comparative Analysis; Educational Diagnosis; Elementary Education; *Gifted; Independent Study; Instructional Development; *Learning Disabilities; Student Attitudes; Student Characteristics; *Student Interests; *Teaching Methods
IDENTIFIERS Learning Style Inventory

ABSTRACT

A study classified and compared the learning style preferences of learning-disabled (LD) and gifted elementary school students with peers who were not identified as gifted or LD. The Learning Style Inventory (Dunn, Dunn, and Price, 1981), covering 22 learning style elements grouped under four categories (environmental, emotional, sociological, and physical elements), was administered to the students. Data were analyzed using descriptive and multivariate statistics to determine relationships among learning style preferences and the three groups of students. Results indicated that LD students preferred more mobility while studying. Gifted students preferred to learn alone. Gifted students preferred more food and drink intake while learning than did their LD peers. LD students preferred the presence of an authority figure, while gifted students did not. Students not identified as gifted or LD perceived themselves as being less mobile than the other two groups and preferred to learn with peers. Recommendations are formed regarding use of these results: in the classroom; implementation of the Education for All Handicapped Children Act; organization of resources to improve student achievement; organization of facilities to accommodate various modes of instruction; examination of staffing patterns; organization of class schedules; components of academic advising; staff development programs; educational leadership; and fiscal support. (CB)

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DEVELOPING PRESCRIPTIONS WITH A MICROCOMPUTER PROGRAM FOR LEARNING DISABLED AND GIFTED STUDENTS BASED ON LEARNING STYLE INSTRUCTIONAL STRATEGIES

BY

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The purpose of this study was to classify and compare the learning style preferences of learning disabled students and gifted students in five elementary schools so as to provide an additional dimension in the educational diagnostic and prescriptive practices for such students. This additional dimension also includes developing prescriptions with a microcomputer program based on learning style instructional strategies.

BACKGROUND OF THE STUDY

Meeting the needs of individual students has been a concern of educators for years. The importance of the responsibilities of instructional leaders to address the needs of the individual and to improve student achievement in schools is compounded by those special classes of students identified as learning disabled or gifted, since those students are generally separated from the rest of the students for a portion of the school day.

Recent studies on effective schools have emphasized the pivotal role of the principal in the development of effective schools. National commissions and reports have suggested that instructional leaders have a responsibility to address the needs of the individual in order to improve student achievement. Additional national legislation and state legislation

have mandated that instructional leaders identify the individual needs of students, especially the individual needs of special education students and gifted students.

While current research lends support to the conclusion that both achievement and affective outcomes of schooling can be enhanced by attention to learning styles, no consistent pattern emerges from the limited research on the characteristics of learning disabled students and gifted students. Thus this study was conducted using those groups of students. Learning style preferences were identified using the research of Dunn, Dunn, and Price (1978).

LEARNING STYLES

Learning style refers to a student in terms of those educational conditions under which he or she is most likely to learn. Like individual differences among students, there exist many possible variations in the learning styles of students.

Dunn and Dunn (1978) investigated educational, industrial and psychological research concerned with how children and adults learn, and isolated 22 elements that comprise learning style. These elements are grouped under four classifications as follows:

A. Environmental Elements

1. noise level - quiet or sound preferred
2. light - bright or low light preferred
3. temperature - warm or cool temperature preferred

4. design - formal or informal design preferred

B. Emotional Elements

5. motivated or unmotivated

6. adult-motivated

7. teacher-motivated

8. persistent or not persistent

9. responsible or not responsible

10. structure - prefers or does not prefer structure

C. Sociological Elements

11. prefers learning alone or with peers

12. prefers learning with adults

13. prefers learning through several ways

D. Physical Elements

14. auditory preferences

15. visual preferences

16. tactile preferences

17. kinesthetic preferences

18. requires intake

19. functions best in evening or morning

20. functions best in late morning

21. functions best in afternoon

22. needs mobility

The Dunns advocate creating an environment and choosing a style which best matches each student's preferred way of

learning. For identifying these student learning preferences, they have developed a Learning Style Inventory (Dunn, Dunn, and Price, 1981), and the inventory was used in this study to classify the learning style preferences of the students.

RESEARCH PROCEDURE

Problem

The problem addressed by this study was the classification and comparison of learning style preferences of learning disabled students and gifted students in order to provide an additional dimension in the educational diagnostic and prescriptive practices for such students. The first issue of this study was whether there existed specific or unique learning style preferences of learning disabled students, gifted students, and students in the general school population students. The second issue was whether there existed a difference in the learning style preferences of the learning disabled students, the gifted students, and the general school population. The third issue was whether the learning style preferences of the learning disabled students, the gifted students, and the general school population students could be explained according to the background variables of age, sex, and grade level. Finally, this investigation sought to provide an additional data base to make better administrative decisions, such as organization of the school day, design of classrooms and

facilities, staff development for teachers and various instructional leaders, and improvement of student achievement.

Methodology

After the Learning Style Inventory was administered to the students in the three groups, the data were analyzed using descriptive and multivariate statistics to determine the relationship between learning style preferences and the three groups: students identified as learning disabled (Group LD), students identified as gifted (Group G), and students who had not been so identified (Group N). The variables included in the analysis were the 22 elements of learning style as identified by Dunn, Dunn, and Price (1978), the groups themselves, and the background variables of age, sex, and grade level.

CONCLUSIONS

Based on the findings of this study, the following conclusions were formed:

1. There are distinct learning style preferences common to each of the three groups of students: learning disabled students, gifted students, and students not identified as learning disabled or gifted.

2. Learning disabled students preferred more mobility while studying. They preferred authority figures to be present and preferred to learn alone. Learning disabled students perceived themselves as being less responsible than the gifted

students and the average students; and they did not require as much intake while studying.

3. The gifted students preferred to learn alone and did not prefer authority figures present while studying when compared to the learning disabled students. They perceived themselves as being more responsible than did the learning disabled students; and they needed less mobility than the LD group, and preferred more intake while studying than did the students in the other two groups.

4. The students not identified as learning disabled or gifted perceived themselves as being less mobile than the other two groups. They preferred to learn with peers; and they perceived themselves as being more responsible than the learning disabled students or the gifted students.

5. There was no significant relationship between the students in the three groups and the independent variables of age, sex, and grade level.

RECOMMENDATIONS

There is little research about how to organize an institution's instructional program so as to offer alternative instructional paths consistent with students' varied learning styles. Yet administrative theory, institutional change theory, and individualized instructional theory suggest key factors that must be addressed in order to implement instruc-

tional programs that fully utilize information on student learning styles (Claxton & Ralston, 1978; Fact Sheets, 1981). Based on these factors and the findings and conclusions from this study, the following recommendations are presented :

1. Discriminating learning style elements.

a. Two of the learning style elements which discriminated between the three groups were "authority figures present" and "learning alone." Since the learning disabled students preferred authority figures present and preferred to learn alone, frequent teacher interaction and direction should be provided, the students' desks might be placed near the teacher, and assignments might include projects which involve the parents or other adults. The gifted students, who did not need authority figures present and who do prefer to learn alone, should be provided an individualized study area or carrels during a portion of the school day, or the room should be arranged so that their desks could be placed away from others.

b. Another of the discriminating learning style elements was "responsible." The learning disabled students, who perceived themselves as being less responsible, might be given short-term assignments with only one or two objectives and frequent teacher reinforcement and feedback. The gifted students and general population students might be given short-term assignments which could gradually be increased in their length

and scope, challenging the students to the optimum level of their abilities.

c. Another of the learning style elements which discriminated among the three groups was "requires intake." Since the learning disabled students did not need to eat or drink as much as the gifted students or the average students, these students might be allowed to choose their own snack time if they wished. The students requiring more intake, the gifted students and the general population students, might be allowed to take frequent snack breaks during the day or to keep food or drink at their learning station.

d. The final discriminating learning style element was "mobility." The gifted students and the general population students, who preferred less mobility, might be assigned to a separate independent study area or learning station for a portion of the school day where most of the student's assignments could be completed without requiring excessive movement. The LD students could be provided frequent breaks, assignments that require movement to different locations, and schedules that build mobility into the learning pattern. These students should be judged on their achievements, not their immobility.

2. The implementation of P.L. 94-142, Education for All Handicapped Children Act, and P.L. 95-561, Gifted and Talented Children's Education Act, can be enhanced by the study of learning styles of learning disabled students and gifted stu-

dents. The prescriptions for each of these students, based on their learning style preferences, should become an integral part of the Individual Education Plan (IEP) of each student. Administrators need to also be aware of current federal, state, and local policy affecting these students, as well as previously established policies.

3. Resources need to be organized to assist with the preparation of materials in order to improve student achievement. Objectives of each program and course that identify outcomes for the student should be written and evaluated. These objectives would give the student and the teacher a tool for planning learning activities to meet those objectives which are complimentary to each student's learning style. Alternative perceptual methods for students to achieve the objectives, including visual, auditory, tactile, or kinesthetic, should be developed for the student's information and decision-making. Based on the discriminating elements of this study, learning disabled students would generally respond better to multisensory instructional packages, gifted students would respond better to contract activity packages which include higher cognitive concepts and processes, and the average students would respond better to programmed learning materials. (Format for these instructional packages are described in Dunn and Dunn, 1981).

4. Facilities need to be organized to accommodate various modes of instructional delivery. Space for different teaching strategies to accommodate different learning styles and appropriate support areas demands total facilities planning. A minimum of six areas are necessary to accommodate various learning styles: testing areas, independent study areas, seminar and conference areas, medium group instruction areas for 30 to 40 students, large group instruction areas for stage presentations and activities for 100 to 1000 students, and conference areas for interaction between the teacher and the student.

5. Staffing patterns need to be examined and other patterns, such as differentiated staffing and the use of paraprofessionals, may need to be implemented. Special grouping arrangements should include a variety of administrative procedures appropriate to learning disabled students and gifted students such as special classes, honor classes, seminars, and resource rooms.

6. The scheduling of classes may need to be reorganized, since successful learning for all students does not occur in the same length of time, during the same time of day, or in the same way. The time frame necessary for completing a set of objectives should be flexible in order to accommodate the learning disabled student and the gifted student. Assigning reading and math groups and administering tests during those

times when the student prefers to learn should increase student achievement.

7. Academic advising needs to include not only selecting courses but also helping students select particular sections taught in particular ways so that students can enroll in those courses that complement their learning styles. If a student's preferred learning style is independent study, like most of the gifted students, the student might be given a study guide, syllabus, and the dates of tests, classroom lectures and other activies necessary for completion of the given objectives. If a student's learning style is that of working with peers and in groups, the student might be given a schedule of seminars to attend and an explanation of how to use peer tutoring services. If the student's learning style indicates that structure and assistance with studies is needed, like most of the learning disabled students, the student might be scheduled for lecture sessions, tutorial assistance, and a structured program of study, including many sessions with the teacher and clear guidelines for study.

8. An effective staff development program and a positive reinforcement system must be implemented to encourage faculty and staff to participate in this type of instructional program. The administrator can provide opportunities for ongoing staff training on such topics as curriculum development and new

strategies for teaching the learning disabled student and the gifted student. Additional time must be allocated to allow faculty time to plan, to develop materials, to prepare instructional packets such as Contract Activity Packages, multisensory packages, and programmed learning packages, and to improve instruction.

9. Appropriate management development should assist those in leadership positions to organize the support and expertise of the faculty and community needed to carry out the instructional program effectively. Norton and Zeilinger's (1983) review of the literature revealed 12 general leadership role functions required of the principal in gifted programs. These functions, which are also appropriate for learning disabled programs, include planning, developing a philosophy, determining goals and objectives, using knowledge of the characteristics of gifted students (and LD students), developing a procedure for identification, developing and administering a financial plan, functioning as the curricular development leader, supervising staffing, providing guidance and counseling services, using community resources, serving as an effective channel of communication, and developing evaluation procedures.

10. Adequate fiscal support is necessary to plan, implement, and sustain the changes needed in the institution. Operating budgets must be built from yearly institutional objectives including learning styles which are based on longer-

range goals.

11. The findings from this study can serve as one basis for the implementation of P.L. 94-142, Education for All Handicapped Children Act, and P.L. 95-561, Gifted and Talented Children's Education Act.

12. While the findings from this study should assist those teachers, administrators, and other instructional leaders who are concerned with the achievement and attitudes of learning disabled students and gifted students, this study and the findings from this study should not be used to rigidly classify those learning disabled students and gifted students into a set pattern without regard for their own unique learning style preferences.

MacKinnon (1978) states:

> The wide range of individual differences surely must mean that there is no single method for nurturing creativity; ideally the experiences we provide should be tailormade, if not for individual students, at least for different types of students. We should remember that the same fire that melts the butter hardens the egg.

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